An Early Assessment of Medium Range Monsoon Precipitation Forecastsfrom the Latest High-Resolution NCEP-GFS (T1534) Model over South Asia

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Abstract: Reliable prediction of the South Asian monsoon rainfall and its variability is crucial for various hydrological applications and early warning systems. The National Centers for Environmental Prediction-Global Forecast System (NCEP-GFS) is one of the popular global deterministic numerical weather prediction models, which is recently upgraded from T574 to T1534. In this paper, medium range monsoon precipitation forecasts from both the T1534 and T574 models are critically evaluated over the South Asia for the peak monsoon months (July and August) of 2015. Although both the versions of GFS model show similar large-scale monsoon rainfall patterns, the dry bias over the northwest India and equatorial Indian Ocean is noticeably improved in day-1 through day-5 forecasts in the new high-resolution T1534 model. The error decomposition analysis shows similar error characteristics in the monsoon rainfall prediction from both the versions of GFS model, in general. However, forecast improvement factor shows 10–30 % improvement in precipitation forecast from the latest T1534 model over most parts of the South Asia. These preliminary analyses suggest that a suitable bias-correction to the GFS model precipitation forecasts will be useful for any specific application.

Keywords: Numerical weather prediction, South Asian monsoon rainfall, medium range weather forecast, error decomposition, forecast improvement factor.